

Serial No.: 09/856,164  
Atty. Docket No.: P66724US0

**REMARKS**

The Office Action mailed October 6, 2003, has been carefully reviewed and by this Amendment, claims 1-10 have been amended and new claims 11-19 have been added. Accordingly, claims 1-19 are pending in the application. In view of the amendments and the following remarks, favorable reconsideration of this application is respectfully requested.

The Examiner objected to the abstract and specification as containing informalities which Applicants have herein corrected. A replacement abstract incorporating the changes is submitted herewith on a separate sheet. However, with respect to the Examiner's objection to page 2 of the specification, regarding a redundant paragraph, Applicants are not certain as to the basis of this objection, noting no redundancy, and request clarification.

The Examiner objected to the drawings as containing informalities. With respect to the language relating to "the walls of the sleeve", Applicants note that the pending claims are those presented in the Amended Sheets accompanying the International Preliminary Examination Report and that, in these sheets, the language noted had already been omitted from claim 1. Accordingly, the basis for this objection has been removed.

Serial No.: 09/856,164  
Atty. Docket No.: P66724US0

The Examiner objected to claims 1-10 as containing informalities which Applicants have corrected herein.

The Examiner rejected claims 1, 2, 5, 8 and 10 under 35 U.S.C. 102(e) as being anticipated by U.S. Patent No. 6,030,290 to Powell. Under 35 U.S.C. 102(b), the Examiner rejected claims 1-3 and 6-9 as being anticipated by U.S. Patent No. 5,826,578 to Curchod, and rejected claims 1 and 4 as being anticipated by U.S. Patent No. 5,490,784 to Carmein.

As set forth in the inventor's Declaration Under 37 C.F.R. 1.131 submitted herewith, the present invention was conceived and actually reduced to practice prior to the filing date of the application for the Powell patent. Therefore, the Powell patent is not prior art with respect to the present invention. Accordingly, withdrawal of the rejection of claims 1, 2, 5, 8 and 10 on the basis of Powell is requested.

With respect to Curchod and Carmein, the Examiner asserts that these references disclose on/off sensors placed on a joint. On the contrary, the sensors placed on a joint in Curchod and Carmein are repeating sensors of the progressive type, i.e., sensors which sense the continuous increase of displacement so as to provide *quantitative* measurement of movement.

Serial No.: 09/856,164  
Atty. Docket No.: P66724US0

More specifically, Curchod describes the function of the sensors disclosed therein at column 4, lines 6-10:

As knee joint 24 straightens or bends, the sensor 22 detects the movement of rod 26 and generates an electric signal indicative of the shift in position of knee joint 24. In so doing, quantitative measurement of the movement of knee joint 24 and the other joints to which sensors 22 are attached is achieved.

Similar disclosure is provided at column 4, lines 16-18, where it is noted that the "sensors 22 quantitatively measure the movement of joints in more than one dimension where needed". This is unlike the simpler, more streamlined operation of the *on/off* sensor according to the present invention which, as stated, is either "on" or "off".

Similarly, in Carmein, the function of the sensors disclosed therein is to provide accurate and continuous body position information, including graduated movements of the user's body within a range of movement, by monitoring relative changes in pressure within a plurality of bladders (see column 12, lines 15-30). For example, "as pressure in the first bladder (512) increases, pressure in either the second bladder (532) or third bladder (552) may decrease giving direct indication of the position of the user" (column 12, lines 27-30). In particular, as far as a directional indication of position is mentioned in Carmein as being given by an "increase" of the pressure sensed by

Serial No.: 09/856,164  
Atty. Docket No.: P66724US0

the sensor, the skilled person would understand the sensed pressure as directly tied to the degree of bending, i.e., that the pressure sensor was a sensor able to deliver the progressively increasing or decreasing pressure value.

In conclusion, neither of these two patents, Curchod or Carmein, disclose or suggest the particular feature of the present invention according to which the sensor is an on/off sensor. Thus, neither of these two documents provides the advantage of such an on/off sensor, i.e., uncomplicated processing on simple binary output signals and thus more efficient control of the equipment and of the software, for example, in the case of video games.

Nor would there be any suggestion to modify Curchod or Carmein to include an on/off sensor as to do so would negatively impact the intended function and operation of these two systems. In that both of these references require the tracking of specific and quantitative positional data relating to the user's body, modification of these systems so that a joint position may be represented with only one of two alternative values would be wholly insufficient for their disclosed purposes.

Serial No.: 09/856,164  
Atty. Docket No.: P66724US0

For at least the foregoing reasons, claims 1-10 are neither anticipated by nor obvious in view of the prior art and are patentable thereover.

New claims 11-19 are also in condition for allowance for at least the same reasons already discussed in connection with claims 1-10. Furthermore, should Powell be retained as a valid reference even though antedated by the present invention, claim 11 is not shown or suggested by Powell but is distinguishable over such reference as will now be more fully set forth.

Powell discloses a movement sensor that is placed at a joint of a user for controlling a video game, in particular a fighting video game. This sensor is an inertial movement sensor which, as shown in Figure 2 thereof, relies primarily on a lever 34 which is resiliently biased to return to its rest position by a helicoidal spring 38. The lever is inside a box which prevents any direct triggering thereof.

Neither the lever nor the resilient spring have any direct contact with the carrying joint of the user's body. Hence, the strip which maintains such box containing the sensor in Powell is very thin, in that this strip has no function of positioning the sensor for it to be subject to any activating

Serial No.: 09/856,164  
Atty. Docket No.: P66724US0

contact or any physical pressure. Instead, the only purpose of the box is to position the sensor so as to be subject to strong inertias due to movement.

The Powell lever may have two positions, according to which the joint is considered to be inertially displaced in a first or a second direction. That is why, in Figures 1 and 1a, such sensor is placed at an extremity of the limb, so as to receive maximum movement and acceleration during the virtual combat.

In other words, in Figures 1 and 1a of Powell, the sensor can sense no bending movement of the particular joint on which it is placed. On the contrary, it may sense, at most, the bending/extension movement of the joint which is immediately above the carrying joint, i.e., the joint closer to the user's torso, which could induce the speeding-up of the sensor.

In Figures 1 and 1a of Powell, the sensor is placed at no location comparable to the elbow and knee, but at the extremity of the limb which extends directly from the bending elbow or joint. Therefore, while the sensor may be placed in the hollow of a joint, i.e., in the hollow of the wrist and or the ankle, *it does not sense the bending of that particular joint*, nor any bending per se, but only inertial movement which, when

Serial No.: 09/856,164  
Atty. Docket No.: P66724US0

created, may or may not be the result of bending of the joint located above the joint to which the sensor is attached.

The newly amended claim 11, in contrast to Powell, makes clear that the sensor is placed on a particular joint for sensing the bending of *this same particular joint* on which the sensor is directly placed, and not the indirect sensing of the bending of another joint via inertia as in Powell. Unlike Powell, the present invention takes advantage of the user's anatomical structure in which certain joints, such as the elbow, have two inner surfaces on either side of the bending axis which move either toward or away from each other depending upon whether the user bends or straightens his arm (see page 3, lines 33-36). By placing a sensor on at least one of these inside surfaces, advantage may be taken of this natural structure and function (see page 4, lines 1-2).

In addition to the preceding remarks, Applicants submit to the Examiner that the bending detection provided by the present invention not only distinguishes over the prior art but provides improved function through more accurate and realistic depiction of movement.

Specifically, the inertial sensor of Powell is triggered by a speed variation at the placement of the considered inertial sensor. Thus, such inertial sensor can be triggered

Serial No.: 09/856,164  
Atty. Docket No.: P66724US0

even if the particular joint remains fixed, whether in a bent or an extended position. It is sufficient for triggering the inertial sensor that the whole body of the player moves rapidly. Indeed, such an inertial sensor can be triggered, for example, when attached to the hand of a player who remains in a boxer position although not extending any joint of the arm, while however displacing suddenly the whole body such as, for example, for avoiding a strike. The sensor may also be triggered when fixed to the ankle, while walking or slightly jumping, although the leg remains extended with no bending of the knee nor of the ankle.

In the context of a fighting game, for example, these situations create some parasitic signals, i.e., signals which are not associated with a blow. On the contrary, a bending sensor as claimed in claim 11, is triggered only in the case of a bending or an extension of the particular joint on which it is attached.

Furthermore, in the case of an inertial sensor such as that in Powell, a certain amount of speed variation is necessary for triggering the sensor. An inertial sensor can remain inactive/untriggered even if the particular joint is bent or extended when the movement is executed at a slow/comfortable speed and/or without a sufficient shock. Such a sensor can thus be physically dangerous for the user or for persons in the



Serial No.: 09/856,164  
Atty. Docket No.: P66724US0

immediate vicinity, simply because it does require such speed variation. Furthermore, a particular mental and/or physical effort is required to effect the required amount of speed variation which, when the user is tired, is uncomfortable for him.

This is not the case for the bending sensor as claimed by the present invention which is triggered when the user bends or extends the limb, be it at a slow/comfortable speed or at a high speed.

In addition, a movement sensor, such as Powell's sensor, does not allow a user to keep the sensor active in a continuous or maintained mode. It is, however, sometimes desired that the delivered signal be kept at one particular value of two possible values provided by a sensor (for example, for preparing a particular combination of blows, or to seize the adversary in a fighting game). Keeping an inertial sensor such as Powell's in an active position is not possible except by making several quick succeeding accelerations, i.e. jerks, of the particular limb which carries the sensor. Such type of gesture is not realistic and is completely contrary to what is desired when playing a video game.

In particular when the controlled object in the game is a character whose gestures are expected to be the same as those

Serial No.: 09/856,164  
Atty. Docket No.: P66724US0

of the user's, such jerks are not acceptable. Such problem does not exist in the case of a bending sensor placed directly on the monitored joint, with which it is possible to output a maintained bending or extension signal by simply keeping the considered joint in the corresponding bent or extended position (see page 4, lines 26-29).

For at least the foregoing reasons, claim 11 is not shown or suggested by Powell, nor by Curchod or Carmein as previously discussed in connection with claims 1-10. Accordingly, favorable consideration of claim 11, as well as claims 12-19 dependent thereon, is requested.

Finally, with respect to the Declaration Under Rule 1.131 submitted herewith and the prior art reference of Powell, Applicants request that whatever determination is made by the Examiner relative to the allowability of claims 1-19, that the basis for such allowability and the status of Powell as prior art relative to the claimed invention or as having been removed as prior art be clearly indicated on the record.

With this amendment and the foregoing remarks, it is respectfully submitted that the present application is in condition for allowance. Should the Examiner have any questions or comments, the Examiner is cordially invited to telephone the

Serial No.: 09/856,164  
Atty. Docket No.: P66724US0

undersigned attorney so that the present application can receive  
an early Notice of Allowance.

Respectfully submitted,

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